

Bobba's Publications List

Book

Sources of Vorticity, with H. Hornung, in preparation

Journals

1. K. M. Bobba, B. Bamieh and J. C. Doyle, Highly optimized transitions to turbulence (submitted to Physics of Fluids)
2. K. M. Bobba and J. C. Doyle, A framework for generalized hydrodynamic stability (to be submitted to Physical Review E)
3. K. M. Bobba and J. C. Doyle, Generalized hydrodynamic stability with singular values, induced norms and gramians (to be submitted to Science)
4. K. M. Bobba and J. C. Doyle, Uncertainty analysis of transition to turbulence in 2D/3C Couette flow (to be submitted to Physics of Fluids)
5. K. M. Bobba and J. C. Doyle, Gramian based methods for reducing the dimensions of multiscale fluid dynamic problems (to be submitted to Journal of Fluid Mechanics)
6. K. M. Bobba, J. C. Doyle and M. Gharib, DPIV and LDV investigation of laminar-turbulent transition (to be submitted to Journal of Fluid Mechanics)
7. K. M. Bobba and H. G. Hornung, On vorticity flux uniqueness and paradoxes (to be submitted to Journal of Fluid Mechanics)
8. K. M. Bobba, The modified Fibonacci numbers (submitted to Fibonacci Quarterly)
9. K. M. Bobba, S. V. Raghurama Rao and S. M. Deshpande, Kinetic smooth particle hydrodynamics -1D (submitted to Journal of Computational Physics)
10. S. Ramanan, K. M. Bobba, S. V. Raghurama Rao and S. M. Deshpande, New Boltzmann schemes for viscous flows (submitted to Theoretical and Computational Fluid Dynamics Journal)
11. B. Karthik, B. Manoj Kumar and R. I. Sujith, Exact solution to one-dimensional acoustic fields with temperature gradient and mean flow, Journal of Acoustical Society of America, 108, (1), 38-43, 2000
12. B. Manoj Kumar and R. I. Sujith, Exact solution for one-dimensional acoustic fields in ducts with a polynomial mean temperature profile, Journal of Vibration and Acoustics, 120, (4), 965-69, 1998
13. B. M. Kumar and R. I. Sujith, Exact solution for longitudinal vibration of non uniform rods, Journal of Sound and Vibration, 207, (5), 721-29, 1997
14. B. Manoj Kumar and R. I. Sujith, Exact solution for one-dimensional acoustic fields in ducts with a quadratic temperature profile, Journal of Acoustic Society of America, 101, (6), 3798-99, 1997

Proceedings

1. K. M. Bobba, J. C. Doyle and M. Gharib, DPIV investigation of laminar-turbulent transition (to be submitted)
2. K. M. Bobba and H. G. Hornung, Angular momentum and vorticity (to be submitted)
3. K. M. Bobba and J. C. Doyle, Techniques for Simplifying Multiscale, Linear Fluid Dynamics Problems, Proceedings of SIAM Conference on Applied Linear Algebra, July 15-19, 2003, The College of William and Mary, Williamsburg, VA
4. K. M. Bobba, J. C. Doyle and M. Gharib, Stochastic input-output measures for transition to turbulence, AIAA Paper No. 2003-0786, 41st Aerospace Sciences Meeting and Exhibit, Jan 6-9, 2003, Reno, Nevada, USA
5. K. M. Bobba, J. C. Doyle and M. Gharib, A Reynolds number independent model for turbulence in Couette flow, Proceedings of IUTAM Symposium on Reynolds Number Scaling in Turbulent Flows, Sep 11-13, 2002, Princeton, New Jersey, USA
6. K. M. Bobba, B. Bamieh and J. C. Doyle, Robustness and Navier-Stokes equations, Proceedings of IEEE 2002 Conference on Decision and Control, Dec 10-13, 2002, Las Vegas, Nevada, USA
7. K. M. Bobba, J. C. Doyle and M. Gharib, Input-output measures, boundary layer vortices and transition to turbulence, Proceedings of 14th Australasian Fluid Mechanics Conference, Dec 9-14, 2001, South Australia, Australia (unable to attend due to financial reasons)
8. B. Manoj Kumar, S. V. Raghurama Rao and S. M. Deshpande, Kinetic smooth particle hydrodynamics - A novel gridless method for compressible flows, Proceedings of 3rd Asian CFD Conference, pp 249-254, Dec 07-11, 1998, Bangalore, India

9. S. Ramanan, B. Manoj Kumar, S. V. Raghurama Rao, K. Anandhanarayanan and S. M. Deshpande, New Boltzmann schemes for viscous flows, Proceedings of 3rd Asian CFD Conference, pp 255-260, Dec 07-11, 1998, Bangalore, India
10. B. Manoj Kumar and R. I. Sujith, Exact solution for longitudinal vibration of non-uniform rods, Proceedings of 48th Annual General body meeting of the Aeronautical Society of India, pp 199-208, Jan 26-28, 1997, Trivandrum, India
11. B. Manoj Kumar and R. I. Sujith, Sound propagation in combustors with temperature gradients, Proceedings of 3rd National Conference on Air Breathing Engines, pp 315-324, Dec 28-30, 1996, Madras, India

Papers Under Preparation

1. K. M. Bobba, On m-numbers, Hoggat steps and Pascals triangle
2. K. M. Bobba, S. V. Raghurama Rao and S. M. Deshpande, A two dimensional kinetic smooth particle hydrodynamics method
3. K. M. Bobba, Receptivity analysis using Pontryagin maximum principle
4. The stochastic dynamics of elliptic vortex in a turbulent flowfield (with Anthony Leonard)
5. LES with Kalman filtering (with Branko Kosovic, Ravi Samtaney and Anthony Leonard)
6. K. M. Bobba, Structural stability of Poiseuille flow
7. K. M. Bobba, Some New exact solutions to Navier-Stokes equations
8. K. M. Bobba, Optimal and robust control of stream-wise vortices in boundary layer
9. K. M. Bobba and R. I. Sujith, Sound propagation in two dimensional ducts
10. K. M. Bobba, Error management in fluid imaging techniques with Kalman filter

Reviewed Conferences

1. K. M. Bobba and J. C. Doyle, Systems and controls concepts in transition to turbulence, 4th SIAM Conference on applications of Linear Algebra in Signals, Systems and Control, Aug 13-16, 2001, Boston, Massachusetts, USA
2. K. M. Bobba and J. C. Doyle, Uncertainty, robustness concepts and transition to turbulence in channel Flows, Sixth SIAM Conference on Applications of Dynamical Systems, May 20-24, 2001, Snowbird, Utah, USA
3. R. I. Sujith, B. Karthik, R. K. Mohanraj, R. Ramakrishnan and B. Manoj Kumar, Exact solution to one-dimensional acoustic fields with temperature gradient, mean flow and damping, Inter noise 98, Nov 16-18, 1998, Christchurch, New Zealand
4. B. Manoj Kumar and R. I. Sujith, The m-numbers, 84th session of Indian Science Congress, Jan 03-08, 1997, New Delhi, India

Published Abstracts and Invited Talks

1. Kumar M Bobba, Modern stability of fluid flow: Application to transition to turbulence, Dept. of Mechanical Engineering, Jun 4-5, 2003, Stanford University, Palo Alto, CA
2. Kumar M Bobba, Generalized hydrodynamic stability: Theory, computations and experiments in shear flow turbulence, Dept. of Mechanical Engineering and Materials Science, Mar 4, 2003, Duke University, Durham, NC
3. Kumar M Bobba, Generalized hydrodynamic stability: Theory, computations and experiments in shear flow turbulence, Dept. of Mechanical and Aerospace Engineering, Feb 10, 2003, Rutgers University, New Brunswick, NJ
4. Kumar M Bobba, Generalized hydrodynamic stability: Theory, computations and experiments in shear flow turbulence, Dept. of Mechanical and Aerospace Engineering, Feb 7, 2003, Tulane University, New Orleans, LA
5. Kumar M Bobba, Generalized hydrodynamic stability: Theory, computations and experiments in shear flow turbulence, Dept. of Mechanical and Aerospace Engineering, Feb 27-28, 2003, Florida State University, Tallahassee, FL
6. Kumar M Bobba, New methods for reducing the dimensions of multi-scale fluid dynamic problems, Molecular Modeling and Computation: Perspectives and Challenges, CIMMS-IPAM Workshop, Nov 15-16, 2002, Caltech, Pasadena, CA
7. Kumar M Bobba, Optimal and robust control of stream-wise vortices in boundary layer, GALCIT Fluid Mechanics Research Conference, Oct 8, 2002, Caltech, Pasadena, CA

8. Kumar M Bobba, Generalized hydrodynamic stability theory, Computational Plasma Physics/ Theory Seminar, Princeton Plasma Physics Laboratory, Sep 12, 2002, Princeton University, Princeton, Newjersey (Invited Lecture)
9. Kumar M Bobba, A new look at laminar-turbulent transition using control theoretic tools, Dept. of Mechanical and Aerospace Engineering, Sep 13, 2002, Polytechnic University, Brooklyn, Newyork (Invited Lecture)
10. Kumar M Bobba, John C Doyle and Mory Gharib, Techniques for simplifying multiscale, linear fluid dynamics problems, 55th APS Division of Fluid Mechanics Meeting, Nov 24-26, 2002, Dallas, Texas
11. Kumar M Bobba, Gramian based methods for reducing the dimensions of multiscale, linear fluid dynamic problems, 2nd Southern California Applied Mathematics Symposium (SoCAMS), May 4, 2002, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, CA
12. Kumar M Bobba, Do we need instabilities for turbulence?, GALCIT Fluid Mechanics Research Conference, Feb 12, 2002, Caltech, Pasadena, CA
13. Kumar M Bobba and John Doyle, Highly optimized turbulence, International Conference on Chaos and Non-linear Dynamics (Dynamics Days), Jan 4-7, 2002, Baltimore, Maryland
14. Kumar M Bobba, HOT: A new route to turbulence, Dept. of Mechanical Engineering, Nov 09, 2001, University of California, Riverside, CA (Invited Lecture)
15. Kumar M Bobba, Understanding the role of uncertainty in transition to turbulence, Dept. of Aerospace Engineering, Aug 21, 2001, Indian Institute of Technology-Madras, Chennai, India (Invited Lecture)
16. Kumar M Bobba, Techniques for approximation of complex, linear fluid dynamic problems, Dept. of Aerospace Engineering, Aug 24, 2001, Indian Institute of Science, Bangalore, India (Invited Lecture)
17. Kumar M Bobba, Generalized hydrodynamic stability: Application to turbulence, Fluid Dynamics Colloquium, Aug 23, 2001, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India (Invited Lecture)
18. Kumar M Bobba, A control theoretic approach to transition to turbulence, Dept. of Aerospace Engineering, Sep 10-11, 2001, Indian Institute of Technology-Bombay, Mumbai, India (Invited Lecture)
19. Kumar M Bobba, A framework for uncertainty analysis in transition to turbulence, Workshop on Preservation of Stability under Discretization, May 30-June 2, 2001, Colorado State University, Fort Collins, Colorado
20. Kumar M Bobba, Receptivity analysis using Pontryagin maximum principle, GALCIT Fluid Mechanics Research Conference, Apr 10, 2001, Caltech, Pasadena, CA
21. Kumar M Bobba and George M Homsy, On the motion of long bubbles in rough cylindrical tubes, 1st Southern California Applied Mathematics Symposium (SoCAMS), May 12, 2001, Caltech, Pasadena, CA
22. Kumar M Bobba, John C. Doyle and Bassam Bamieh, Highly optimized tolerant (HOT) route to transition to turbulence, 54th APS Division of Fluid Mechanics Meeting, Nov 18-20, 2001, San Diego, CA
23. Kumar M Bobba and John C Doyle, A novel model reduction technique for fluids, 2001 APS Annual meeting of the Division of Computational Physics, June 25-28, 2001, MIT, Cambridge, Massachusetts (unable to attend due to financial reasons)
24. Kumar M Bobba, Uncertainty concepts, complexity and transition to turbulence, GALCIT Fluid Mechanics Research Conference, Oct 10, 2000, Caltech, Pasadena, CA
25. Kumar M Bobba and John C Doyle, Uncertainty concepts, complexity and transition to turbulence in shear flows, NSF-KDI/IGPP Workshop on Accurate Simulation and Modeling of Physical Systems, Nov 9-10, 2000, UCSD, La Jolla, CA
26. Kumar M Bobba, Robustness and transition to turbulence in boundary layer flows, GALCIT Fluid Mechanics Research Conference, Apr 04, 2000, Caltech, Pasadena, CA
27. B. Manoj Kumar, The m-numbers, Dept. of Mechanical Engineering, Nov 27, 1997, Bapatla Engineering College, Nagarjuna University, AP, India (Invited Lecture)

Reports

1. Ph.D. Thesis: Generalized Hydodynamic Stability: Theory, Computations and Experiments in Shear Flow Turbulence, Dec 2003, California Institute of Technology, Pasadena, CA, USA
2. K. M. Bobba, J. Doyle and M. Gharib, 2001, Non-Normality and Taylor-Couette flow, FM 01-3, Graduate Aeronautical Laboratories, California Institute of Technology, Pasadena, CA, USA
3. B. Manoj Kumar, R. Balasubramanian, S. V. Raghurama Rao and S. M. Deshapnde, 1997, Kinetic Flux Vector Splitting for Navier-Stokes Equations Using Chapman-Enskog Distribution, FM 97-8, Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India

4. B. Manoj Kumar, S. V. Raghurama Rao and S. M. Deshapnde, 1997, Kinetic Smooth Particle Hydrodynamics Method using Peculiar Velocity Based Upwinding and Least Squares, FM 97-22, Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India
5. B.Tech. Thesis: New Upwind Methods Based on Kinetic Theory for Compressible Flows, 1998, Department of Aerospace Engineering, Indian Institute of Technology-Madras, Chennai, India
6. B. Manoj Kumar, Asymptotic Solution of Compressible Rayleigh Problem, 1997, Department of Aerospace Engineering Report, Indian Institute of Technology-Madras, Chennai, India